

efficiency, was much superior to any of the others, and the indications are that a satisfactory and practicable method of control can be developed. A report on these experiments is in course of publication, and the results have been made available to the Agriculture Department.

Paris green is not normally imported into New Zealand in large quantities and is at present in short supply, though enough has been secured to enable a continuation of the experiments in the coming season.

Attention has been devoted to the utilization of mechanical devices for spreading the bait. The plans and specifications of a machine designed in U.S.A. for this purpose have been obtained and the possibility of adapting manure-distributors for this purpose is being investigated.

Residue on Sprayed Pasture.—A programme of sampling of pasture sprayed with arsenical poisons was carried out in order to obtain information on the rate of disappearance of the arsenic residue from the pasture. The estimation of arsenical residues is being done by the Animal Research Station at Wallaceville.

Life-history and Ecology of Oxycanus.—Much information has been accumulated on the time of flight of the moths as revealed by light traps. Observations have been made on the oviposition habits of the moths. A start has been made on the experimental work dealing with the factors influencing the development of the eggs and the relation between pasture composition and damage by *Oxycanus* larvæ. As opportunity offers, observations have been made on the effect of native parasites and diseases on the numbers of *Oxycanus*.

(5) ODONTRIA ZEALANDICA (GRASS-GRUB).

Inquiries made in U.S.A. indicate that none of the introduced parasites of the Japanese beetle are likely to be effective parasites of our grass-grub, but the U.S. Bureau of Entomology has supplied information, based on the work of one of their officers in Australia, indicating that several parasites of related beetles in Australia show considerable promise as possible parasites of our grass-grub.

Through the co-operation of the U.S. Bureau of Entomology, arrangements have been made to test a bacterial disease of Japanese beetle larvæ on the New Zealand grass-grub.

(6) CHEESE-MITES.

A special report has been submitted on this work. This work was carried out as time permitted, though, unfortunately, it was not possible to give it the undivided attention which it warrants. The investigation as far as it went was of value in bringing to light some of the difficulties associated with it. It also confirmed a previous finding that ammonia was an important acaricide, but whether ammonia can be used for fumigating cheese depends on its effect on the cheese itself. Experiments on this phase of the work are being conducted at Massey College. In the event of ammonia not being detrimental to the cheese, further experimental work regarding ammonia concentrations, times of application, and method of employing will have to be carried out.

(7) HAPLOTHRIPS NIGER (CLOVER THRIPS).

In February, 1941, an investigation into the economic importance of the damage to red-clover-seed production caused by thrips was commenced. The adults of three species have been collected from red-clover flower-heads. *H. niger* (Osborn) appears to be by far the most numerous, and the alleged damage is ascribed to this species. Adults and nymphs of *H. niger* have been collected from the flower-heads of *Trifolium pratense*, *T. repens*, *T. arvense*, and *Plantago lanceolata*.

PUBLICATIONS.

The following papers have been published by members of the staff during the year:—

- DICK, R. D. (1940): Observations on Insect Life in relation to Tussock-grassland Deterioration (Preliminary Report)." *N.Z. Jour. Sci. & Tech.*, 22, 19A.
- DUMBLETON, L. J. (1940): "*Tortrix postvittana*, Walk. and its Parasites in Australia." *N.Z. Jour. Sci. & Tech.*, 21, 322A.
- (1940): "Carpet Beetles damage your Clothes." *N.Z. Jour. Agric.*, 61, 282.
- (1940): "*Oncodes brunneus* Hutton: A Dipterous Spider Parasite." *N.Z. Jour. Sci. & Tech.*, 22, 97A.
- (1940): "Australian Parasites of *Eriococcus coriaceus* Maskell." *N.Z. Jour. Sci. & Tech.*, 22, 102A.
- (1941): "The Grass Grub and Subterranean Grass Caterpillar." *N.Z. Jour. Agric.*, 62, 180.
- HAMILTON, AVICE (1940): "The New Zealand Dobson-fly (*Archichauliodes diversus* Walk.): Life-history and Bionomics." *N.Z. Jour. Sci. & Tech.*, 22, 44A.

GRASSLANDS DIVISION, PALMERSTON NORTH.

Director: Mr. E. BRUCE LEVY.

The work of the Division has been well maintained throughout the year despite the serious loss by fire of the main building and heavy draw on staff for military training. The change-over from the city lease property of 11 acres and the breaking-in of the newly acquired Conway property of 28 acres has placed a large additional burden on the field staff of the Station. The acquisition of the Conway property is an outstanding boon to the work of this Division, and when fully broken in will more than justify its purchase.